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Evidence from Cross-country Analysis

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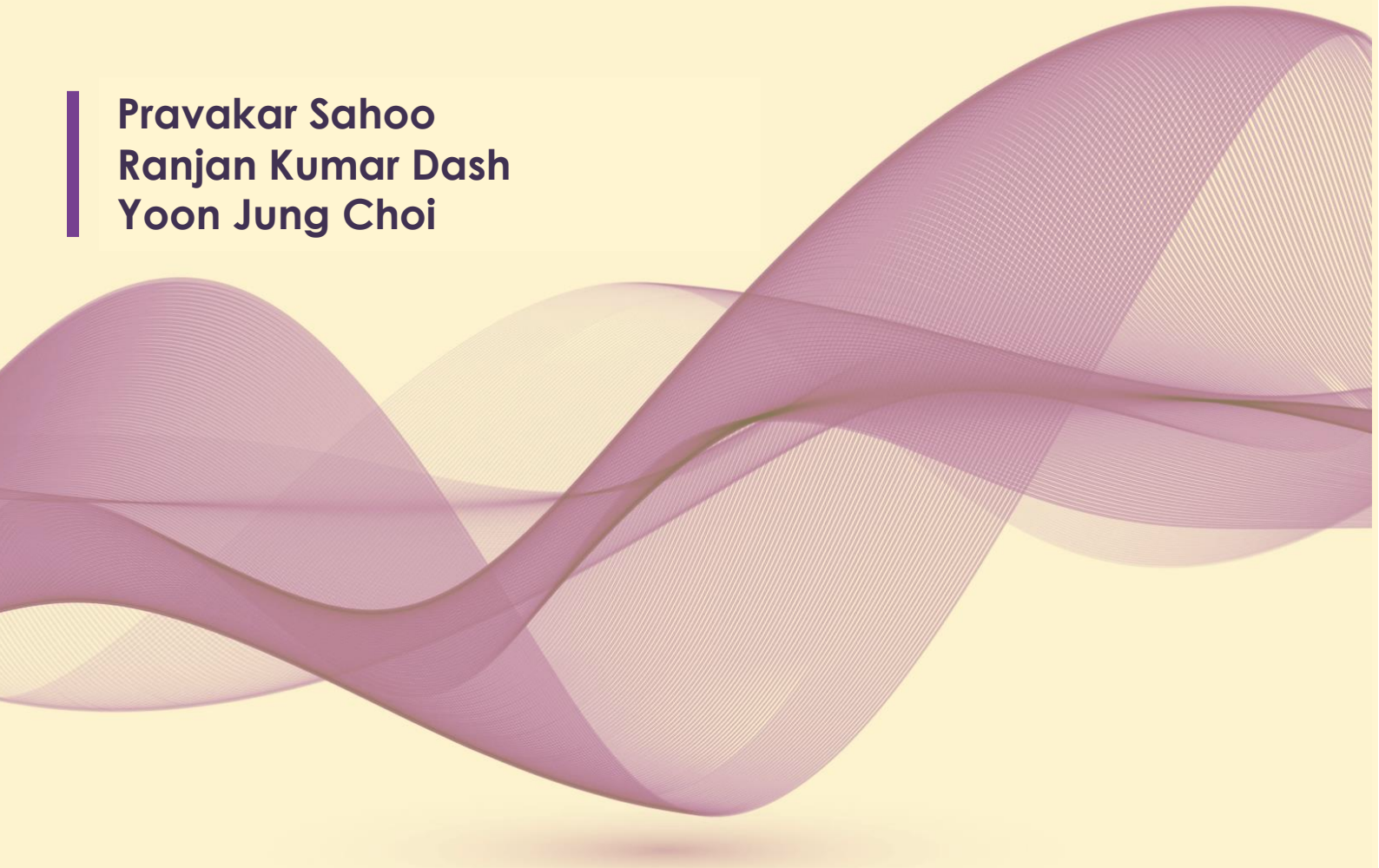

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Abstract

Since the 1990s, there has been an increase in the volume of Foreign Portfolio Investments (FPI) flowing to developing economies. Theoretically, FPI inflows are supposed to promote economic growth by lowering cost of capital, increasing investment, diversifying risk and developing the financial sector. However, FPI - being short term investments – may lead to boom and bust cycle affecting growth and stability. In this context, we empirically examine the impact of FPI on the economic growth for 82 countries for the period 2000-2017. We try to capture the differential effects of FPI across different categories of countries and transmission channels. Results reveal a positive relationship between FPI and economic growth for all sets of developing countries, with the magnitude of benefits being the highest for emerging economies. Moreover, domestic factors such as human capital, financial sector and external debt are found to influence the impact of FPI on growth. Therefore, there is a need to push for pro-FPI policies and develop the absorptive capacities of developing countries to promote and sustain their economic growth.

Keywords: FPI, Economic growth, Developing countries, Panel data, GMM model

JEL Classification: C51, F21, F62, O11

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1. Introduction

Many developing countries initiated substantial reforms, particularly since early eighties, in their external sectors gradually opening and liberalizing their current and capital accounts. The liberalization of these economies also coincided with slowdown in growth and interest rates in developed countries. The discrepancy in interest rate between north and south along with growth opportunities in developing countries resulted in FPI inflows from developed to developing economies. Since then, the volume of portfolio investment has only increased as investors and fund managers in developed countries have sought to take advantage of the market conditions and growth prospects prevailing in developing countries. Theoretically, FPI affects economic growth by lowering the cost of capital, augmenting domestic savings, increasing investment, diversifying risk, developing the financial sector (including capital markets) and improving the overall macroeconomic outcomes for a country (Prasad *et al.*, 2007; Calderón & Nguyen, 2015; Baharumshah *et al.*, 2017). The positive impact of FPI is contingent upon the conditions prevailing in recipient countries including the state of their financial markets, human capital, trade liberalisation, infrastructure and institutions (Adams, 2009; Driffield & Jones, 2013; Baharumshah *et al.*, 2017).

Although a positive impact of FPI on economic growth has been well documented, a number of studies also have found a negative relationship between the two. Lessons learned from various economic crises highlight that short-term FPI – often considered "hot money" - can have adverse effects on the host economy. It can lead to overheating, asset price bubbles, exchange rate volatility, financial instability, and increased vulnerability of economies. As such, excessive capital flows are often accompanied by "boom-bust cycles" wherein FPI inflows could suddenly stop or switch direction in short term triggering crises in external sector, forex market, financial market etc leading to overall economic crisis in recipient countries (Pradhan *et al.*, 2011; Forbes & Warnock, 2012).

In this context, we empirically examine the nexus between FPI and growth for 82 countries and contribute to the literature on impact of FDO on growth. One of the limitations of cross countries studies on impact of FPI on growth is that they presume the similar abortive capacity for each country. However, there exists a wide range of developing countries with large variations in their underlying economic conditions and hence, their absorptive capacities. As a result, FPI inflows may have different implications for different categories of countries in terms

of level of development. Recognizing that the variety of absorptive capacities amongst categories of countries has not been adequately captured in the existing literature, the current paper examines the differential impacts of FPI across such economies. The present study categorizes the countries as Low Income Countries (LICs), Lower Middle Income Countries (LMICs) and Emerging Countries (ECs) and, studies the effect of FPI for each of these categories. In addition, the study investigates the channels through which positive spillovers from FPI occur by incorporating various domestic factors such as levels of trade openness, human capital, financial sector, infrastructure, external debt and institutions in its analysis. As such, the current paper uses data from 82 developing countries and employs a dynamic panel data analysis to understand whether, to what extent and under what conditions FPI spurs economic growth amongst different developing countries. It also studies the direction of causality between FPI and economic growth.

2. Literature Review

FPI is the capital invested by foreign investors and fund managers in the stocks and shares of a host country. FPI has become an increasingly major component of global capital flows and, is currently an important source of foreign capital for developing countries (Baghebo & Apere, 2014). The benefits of FPI are much debated amongst economists. On one hand, capital inflows can supplement domestic investment, improve current account deficit and increase economic opportunities for a host country. On the other hand, such inflows –being short term in nature - are volatile in nature which can suddenly stop or flow out of a country at short notice, having disastrous consequences for its economic growth and stability (Blanchard *et al.*, 2015; Forbes & Warnock 2012; Aizenman *et al*., 2008; Prasad *et al.*, 2007).

Theoretical literature clearly explains the pros and cons of FPI inflows. The capital market liberalization hypothesis postulates that FPI enhances liquidity, diversifies risk, reduces cost of capital and increases the efficiency of local financial markets (Bekaert & Harvey, 2000; Kim & Singal, 2000; Henry, 2000). This helps investors to raise capital and increase investment in the recipient country. Further, FDI inflows infuse liquidity into the capital market thereby increasing availability and access to capital at a lower cost, which is crucial for investment and economic growth (La Porta *et al.*, 1998). Bekaert & Harvey (1998) confirmed the positive growth effect of FPI for a set emerging countries. Similarly, Pal (2006) finds that FPI promotes growth by providing non-debt resources which are complementary to domestic savings and investment. In addition to reducing balance of payment deficits, FPI also removes the foreign exchange constraints. This helps the import of critical raw material and capital goods required

for industrial development. Further, FPI inflows is a sign of financial sector development which reduces both financial and macroeconomic vulnerability (Kose *et al.*, 2010; Ahmad *et al.*, 2015).

However, FPI inflows is usually aimed towards short-term gains which can be volatile in nature and susceptible to flow reversals at short notice. Volatile FPI inflows or reversal can lead to instability in the financial market, particualrly in case the country is in transition or at a nascant stage of development, thereby affecting growth adversely (Rodrik, 1998; Stiglitz, 2000; Bhagwati, 1998). The East Asian crisis of 1997-98 and the 2008-09 financial crises are manifestations of the "boom and bust cycles" that often accompany such inflows. Furthermore, Rodrik and Subramanian (2008) argue that the problem with developing countries is not of capital accumulation but lack of investment opportunities which hinder their growth. Foreign capital, as such, will not make any significant difference unless it brings investment opportunities along with it. In fact, foreign investment may negatively affect growth as it reduces the return on investment by allowing foreign exchange rates to increase which reduces international competitiveness.

As theoretical literature differs on the gains from FPI, empirical literature on the subject is also divided. Karaca and Abasız (2007) investigated the growth impacts of FPI for the panel of 25 developing countries over 1980-2005 and found that the effects of FPI inflows were relatively lower in the low-income countries compared to high income countries. Similarly, Rachdi and Saidi (2011) examined the impact of both FDI and FPI on economic growth for panel of 100 countries over the period 1990-2009. By applying different panel methods such as generalized methods of moment (GMM), WG and GLS estimators, the study finds significant growth impact of FPI for developed countries but no impact for developing countries. Using annual data over the period 1986 to 2013, Ibrahim and Akinbobola (2017) investigated the role of both FPI and democracy on economic growth for Nigeria. The results reveal that that both FPI and democracy had a positive impact on economic growth in the long-run in Nigeria.

Beckmann and Crudaz *(*2017) examined the impact of capital inflows on GDP for 25 emerging countries. Using quarterly data (1988Q1 to 2013Q4) and Bayesian time-varying panel VAR framework, the study reported a significant positive impact of both gross and net FPI on growth. Nyang`oro (2017) used generalized methods of moment (GMM) for the period 1980-2011 and found that portfolio equity investment had positive impact on economic growth for 26 sub-Saharan African countries. Baharumshah *et al.* (2017) found that positive spillover benefits of the FPI is conditional to the level of development, particularly in financial sector.

Therefore, the study concluded that a deeper and more developed financial sector is a pre-condition for experiencing positive impact of private capital inflows. Similarly, other studies (Durham, 2004; Driffield & Jones, 2013; Kose et al. 2010) have found that the positive growth impact of FPI is contingent upon a number of factors prevailing in the host country such as financial sector development, human capital levels, availability of required infrastructure and, quality of institutions.

In addition, few studies also examine the direction of feedback or causality between foreign portfolio investment and growth which is vital for policy discourse. Guluzar and Bener (2013) , examined the causal nexus between FPI and economic growth for Turkey over 1986-2012 using time series analysis and, found no causal links between the two. Similarly, Ahmed *et al*., (2015) investigated the nexus between FPI and GDP for China and India over 2001 to 2013 using the Granger causality and find no causal relationship between foreign portfolio inflows and economic growth for both the countries. On the other hand, Duasa and Kassim (2009) find economic growth caused FPI for Malaysia in the period 1991-2006. Ahmad *et al*., (2015) also examined the direction of causality between FPI and GDP for five East Asian countries (Singapore, Thailand, Philippines, Indonesia and Malaysia) over 2001-2013. The results of Granger causality and Wald test suggest the evidence of causal relationship between FPI and GDP for Thailand, Philippines, Indonesia and Malaysia.

Thus, both theoretical and empirical literature yield inconclusive results regarding the impact of FPI on economic growth of recipient countries. The issue is especially contentious for developing countries. For such countries, foreign investment inflows provide opportunities for securing a much required capital for higher economic growth. At the same time, FPI inflows could exacerbate vulnerabilities as developing countries may not have sufficiently robust institutions to protect them from the negative effects of such inflows. However there exists large variations in the nature of developing countries and as such, FPI may have differential impacts on the economies of such countries. But such differences in the experiences of developing countries have not been adequately captured in the existing literature. Our study strives to fill this gap by categorizing developing countries into LICs, LMICs and emerging countries and, studying the impact of FPI on the growth of each of these categories. Moreover, there is a need to understand more comprehensively the processes through which FPI can affect growth amongst different developing economies. For the purpose, our empirical analysis considers various measures for absorptive capacities including the levels of human capital, infrastructure, financial sector, trade, external debt and institution in these countries.

3. Analytical Framework and Model Specification

The study uses standard neoclassical production function framework to examine the impact of FPI on output (De Mello, 1997; Sahoo *et al.*, 2013).

$$Y = f(K, LF, FPI,..), \quad \text{.....(1)}$$

Where Y refers to GDP per capita, K refers to domestic capital, LF refers to the amount of labor force and, FPI refers to foreign portfolio investment.

Using the existing literature on growth determinants (Mankiw *et al.*, 1992; Barro & Sala-i-Martin, 1995; Kaufmann *et al.*, 2002; Sahoo & Dash, 2012; Sahoo *et al.*, 2013), we add number of control variables namely infrastructure development, trade, human capital, financial development, institutions, inflation, etc. By adding the above control variables equation (1) can be rewritten as:

$$RYPC_{it} = \alpha_i + \delta_{it} + \beta_1 FIND_{it} + \beta_2 TR_{it} + \beta_3 INFD_{it} + \beta_4 HCD_{it} + \beta_5 LF_{it} + \beta_6 GFCF_{it} + \beta_7 INF_{it} + \beta_8 FPI_{it} + \beta_9 INST_{it} + \beta_{10} INCT_{it} + u_{it} \quad \text{.....(2)}$$

The expected sign of (β_1, β_2, β_3, β_4, β_5, β_6, β_8, β_9 and β_{10} is)> 0 and B_7 is<0

Where RYPC is log of real per capita income, FIND is financial development index, TR is trade as ratio of GDP, INFD is infra sector development index, FPI is foreign portfolio investment as ratio of GDP, HCD is human capital development (gross secondary enrolment ratio), GFCF is gross fixed capital formation as ratio of GDP, LF is log of labor force, INF is inflation level (CPI index). INST is Institutional indicator measured in the scale of 0-10 and INCT is the interaction term to capture channel effect of FPI.

The study uses infrastructure and financial development index instead of single indicator as both the variables are multidimensional. Principal Component Analysis (PCA) was used to create INFD by taking three major infrastructure indicators: (1) Telecom density (per 100 people), (2) fixed broadband connection (per 100 people), and (3) air Transport, freight million tons per km (for details on PCA analysis, see Sahoo *et al.*, 2013). Similarly, the financial development index (FIND) is constructed using three financial variables: (1) bank branches (per one lakh people), (2) bank credit to domestic sector (% GDP), and (3) Broad money (M2) as ratio of GDP.

In addition, the present study linearly interacts FPI with several different measures for absorptive capacity**.** Six additional regression equations corresponding to the six different interaction terms were added as explanatory variables including, FPI*Financial development,

FPI*Trade, FPI *human capital, FPI*infrastructure development, FPI* external debt and FPI *Institution**.** The parameters β_9 and β_{10} given in the equation below constitute the main tool of our analysis:

$$\frac{\partial \ln(\text{RYPC})_{it}}{\partial(\text{FPIY})_{it}} = \beta_8 \text{ FPI} + \beta_{10} \text{ INCT} \qquad \ldots\ldots\ldots\ldots(3)$$

If both β_8 and β_{10} are positive (or negative) in the given analysis, then FPI has positive (or negative) effect on growth. But if $\beta_8 < 0$ while $\beta_{10} > 0$, this means that the negative growth effect of FPI needs to be mitigated by domestic factors. In this context, we find the threshold level for the respective factors, which once crossed will ensure positive spillover of FPI inflows.

4. Data Sources and Methodology

Data Sources: Annual data for the study are collected from World Development Indicators (WDI), the World Bank online databases covering 82 developing countries that include: twenty-six low-income countries (LICs), forty-four lower-middle income countries (LMICs) and twelve emerging economies. the study period is from 2000 to 2017 on the basis of availability of compatible data for all the sample countries[4].

Annual data for variables like FPI, per capita income (base year 2010), trade openness, gross fixed capital, enrolment ratio (secondary), total labor force, inflation level (Consumer Price Index, base 2010) and external debt as ratio of GNP were collected from WDI, 2018. The data on infrastructure variables including air freight transport (million tons per km), telecom density (per 100 people) and fixed broadband as well as the data on financial variables which included bank credit to private credit as ratio of GDP, number of bank branches per lakh people and broad money (M2 as ratio of GDP) were also drawn from WDI. Data on intuitional variable (index of economic freedom) was collected from the Heritage Foundation.

Methodology: The study follows four step procedures to investigate the impact of FPI on economic growth. Frist, panel unit root tests were conducted to analyze the time series properties of variables. Second, long-run relationship is established using panel cointegration tests. Third, GMM system model is used to examine the contribution of FPI to economic growth. In the last step, panel causality tests were conducted to find out the direction of causality between FPI and economic growth.

[4] Macro-economic overview of LIC, LMIC, emerging and total sample countries are provided in Appendix Table A1.

Panel Unit root accounting for Cross-section dependency: In the first step, Pesaran (2007) panel unit test is applied to examine the time series properties of variables. The unit root test is carried using the following standard ADF regression augmented by including both lagged levels and first differences:

$$\Delta X_{it} = \alpha_i + b_i X_{i,t-1} + \sum_{j=0}^{p} \Psi ij\, \overline{X}t - 1 + \sum_{j=1}^{p} \lambda ij\ \Delta\overline{X}t + u_{it} \quad \ldots\ldots. \quad (4)$$

Where Δ is the difference operator, $\overline{X}t$ is the cross-section average and P is the lag order. The test for unit root is conducted by assuming null H_0: $b_i = 0$ against the alternative H_a: $b_i < 0$ for at least some i. The average cross sectionally augmented IPS (CIPS) test depends on the average t-ratio which is given by:

$$CIPS = \sum_{t=1}^{N} \frac{ti(N,T)}{N} \qquad \ldots\ldots\ldots(5)$$

Panel Cointegration: In the second step, the Westerlund (2007) panel cointegration test is carried out using the following error correction model to establish long-run relationship between per capital income and FPI:

$$DRYPC_{it} = \theta'i\ dt + \sigma_i\, RYPC_{i,t} - 1 - \psi'i\ FPI_{i,t} - {}_1 + \sum_{j=1}^{pi} \gamma_{ij}\, DRYPC_{i,t} - j + \sum_{j=0}^{pi} \lambda_{ij}\, DFPI_{i,t-j} + e_{it} \ldots\ldots(6)$$

Where σ_i is the cointegration term and the coefficient indicates the speed of adjustment and D is the difference operator and d_t is deterministic term. Four panel tests (two group statistics and two panel statistics) were developed by pooling the error term to test panel cointegration. P_T and P_a are panel statistics and written as:

$$P_T = \frac{\hat{\sigma}}{SE(\hat{\sigma})} \text{ and } P_a = T\hat{\sigma} \qquad \ldots\ldots\ldots..(7)$$

Accordingly, the null and alternative hypothesis is tested as H_0: $\sigma_i = 0$, H_1: $\sigma_i < 0$ for at least some i. G_α and G_T are group statistics and can have written as:

$$G_a = N^{-1} \sum_{i=1}^{N} \frac{T\hat{\sigma}i}{\hat{\sigma}i} \text{ and } G_T = N^{-1} \sum_{i=1}^{N} \frac{\hat{\sigma}t}{SE(\hat{\sigma}t)} \qquad \ldots\ldots\ldots\ldots (8)$$

Accordingly, the null and alternative hypothesis is tested as H_0: $\sigma_i = 0$, H_1: $\sigma_i < 0$ for at least some i.

Panel causality (Dumitrescu and Hurlin, 2012): To examine the ganger causality between the FPI and Growth, the following equations are estimated:

$$DRYPC_{it} = \alpha_i + \sum_{k=1}^{k} \lambda_i^{(k)} DRYPC_{it-k} + \sum_{k=1}^{k} \phi i^{(k)} DFPI_{it-k} + \varepsilon_{it,} \quad \ldots\ldots\ldots (9)$$

$$DFPI_{it} = \alpha_i + \sum_{k=1}^{k} \lambda_i^{(k)} DFPI_{it-k} + \sum_{k=1}^{k} \phi i^{(k)} DRYPC_{it-k} + \varepsilon_{it,} \quad \ldots\ldots\ldots (10)$$

Where D represents the first difference, λ_i is autoregressive and ϕ_i is the slope coefficient which is assumed to differ across series. Causality from FPI to growth is tested by assuming:

$$\phi_i = 0 \text{ for all } i=1,2\ldots,26,$$

against: $\phi_i \neq 0$ for some i.

The test statistic $\overline{Z}$ is used to test causality as $T \rightarrow \infty$ and written as:

$$\overline{Z} = \sqrt{\frac{N}{2K}}(\overline{W} - K) \xrightarrow{d} N(0,1) \quad \ldots\ldots\ldots (11)$$

Where $\overline{W}$ is the average Wald statistics. If T is fixed with T > 5 + 2K and N$\rightarrow \infty$, the approximated standardized statistic ($\tilde{Z}$) is used to test causality and written as:

$$\tilde{Z} = \sqrt{\frac{N}{2K} \times \frac{T-2K-5}{T-K-3}} \left[\frac{T-2K-3}{T-2K-1}(\overline{W} - K)\right] \quad \ldots\ldots\ldots (12)$$

5. The Empirical Analysis

(i) Panel Unit Root Analysis and Panel Cointegration: We use Pesaran (2007) CIPS panel unit root test using two specifications: intercept and intercept with trend and the test results are reported in Table 1. The results reveal that that the null of existence of unit root is not rejected at level for all variables except INST and EXD. However, differenced series are stationary. Hence, the CIPS test indicated mixture of I (0) and I (1) variables.

Table 1: Panel unit root test using Pesaran (2007)

Variables	**At level**		**First difference**	**Order of Integration**
	intercept	**Intercept with trend**	**Constant**	
RYPC	0.65	-0.05	-6.87*	I (1)
LF	-0,76	-1.89	-3.23*	I (1)
TR	0.33	-0.45	-5.46*	I (1)
GFCF	-1.64	-1.76	-3.63*	I (1)
HCD	-0.49	2..21	-3.16*	I (1)
FPI	-1.44	-2.15	-5.34*	I (1)
EXD	-3.56*			I (0)
INFD	--0.49*	-1.45	-4.35*	I (1)
FIND	-0.49	3.68	-7.76*	I (1)

INF	-1.21	-1.56	5.45	I (1)
INST	-3.21*			I (0)

. *"*" indicates rejection of null of unit root at 5% level.*

Having tested and established the stationary properties of the series, we apply panel cointegration test (Westerlund, 2007) to examine the cointegration relationship between per capita income and other relevant variables including FPI. The results of cointegration test for whole sample and sub-samples are reported in Table 2. The results suggest that the null of the no cointegration is rejected by both G_t and $P_{t\ e}$ establishing long-run relationship between income and explanatory variables under consideration including FPI.

Table 2: Panel Cointegration tests (Dependent Variable: RYPC)

Dependent Variable (RYPC)	**Whole sample**	**LIC**	**LMIC**	**Emerging countries**
	Value	**Value**	**Value**	**Value**
Gt	-2.06*	-2.15*	-1.27	-1.61
Ga	-4.81	-3.16	-1.94	-5.74
Pt	-17.76*	-14.35*	-10.45*	-12.45*
Pa	-4.40	-4.67	-9.34*	-13.28*

*Notes: * denotes rejection of null at 5 % level. The cointegrating regression is estimated with constant, and one lag and one lead.*

(ii) Impact of FPI on Growth: Empirical Evidence

After establishing the long-run equilibrium relationship between per capita income and FPI along with other variables, we use system GMM method to examine the contribution of FPI to economic growth in developing countries. The results for the full sample and three sub-samples are presented in Table 3, 4, 5 and 6. Different diagnosis test such as Sargan Test of over-identification and the Arellano-Bond test of 1st order (AR1) and Arellano-Bond test of 2nd order (AR2) indicate that the estimated results are valid. Seven different specifications of Equation (2) are estimated and presented in Table 3, 4, 5 and 6.

All the control variables have expected sign and are statistically significant in different specifications except domestic investment (GFCF). *Model 1* provides the baseline results evaluating the direct growth impact of FPI. In addition, *Models 2-7* presents both direct growth impact while factoring in absorptive capacities (conditional factors) of the full sample and sub-samples.

Full Sample: Results for full sample (Table 3) establish that FPI has a direct positive and significant effect on GDP per capita, validating the hypothesis that FPI has a "direct impact" on economic growth in recipient countries. The coefficient for FPI was o.oo1 implying that a

unit increase in FPI increased per capita income by 0.001 per cent. Thus, FPI seems to positively affect growth through various channels such as increasing investment by diversifying risk and lowering cost of capital, developing the financial sector, augmenting domestic savings through various instruments and, improving overall macroeconomic policies (Prasad *et al.*, 2007; Calderón & Nguyen 2015; Baharumshah *et al.*, 2017). In addition, control variables like trade openness, infrastructural growth, financial sector development and human capital enhancement have positive and statistically significant effect on income per capita. There is enough evidence by now about the impact of these growth drivers for developing countries (Driffield & Jones, 2013; Baharumshah *et al.*, 2017; Sahoo and Dash, 2012; Sahoo (2012). As expected, inflation, which is a sign of macroeconomic instability and structural imbalance, has a negative effect on the income in our analysis.

Next we try to test whether the positive growth impact of FPI is contingent on the absorptive capacities of developing countries which are determined by various domestic factors. For the purpose, six different *interaction terms* added to capture the role of local factors viz. trade, financial development, infrastructure, human capital, external debt and institutions. The results using the different interaction terms are presented in Column 2 to Column 7 respectively of Tables 3. As per the results, factors such as human capital (*Model 2*) and financial development (*Model 5*) have a positive indirect impact on economic growth, while a higher debt burden has a negative impact. In keeping with the findings of Durham (2004) and Baharumshah *et al.* (2017), well developed financial sector is crucial for realizing the positive impacts of private capital inflows. This reflects that rise in FPI inflows increases depth and breadth of the financial sector which lowers cost of borrowing, removes financial constraints, increases efficiency of capital allocation and promotes investment and growth (Durham (2004) and Baharumshah *et al.* (2017)). Similarly, higher human capital levels allow for increased absorption of the anticipated spillovers of FPI such as better management skills, labour standard, business transparency etc. On the other hand, high external debt puts pressure on countries to fulfill their financial obligations and prevents them from investing in areas that could promote growth. Trade, infrastructure and institutions had a positive but insignificant indirect impact on growth. But most importantly, it was revealed that the combined effect of both direct and indirect (β_9 + β_{10}) was positive indicating that FPI had an overall positive growth impact.

Table 3: Estimated coefficients of economic growth (Full sample)

Variables	Model-1	Model-2	Model-3	Model-4	Model-5	Model-6	Model-7
Intercept	0.93	1.13*	1.33*	0.99*	0.94**	1.43**	1.77**
	(1.89)	(2.69)	(2.33)	(2.81)	(4.26)	(3.22)	(4.68)

LF	0.17** (3.11)	0.17* (2.71)	0.11 (1.71)	0.16** (3.71)	0.18** (9.66)	0.09** (8.51)	0.11** (7.45)
TR	0.22** (3.56)	0.23** (4.44)	0.21* (2.84)	0.20** (4.44)	0.18** (6.65)	0.20** (2.98)	0.18** (3.16)
FPI	0.001** (2.99)	0.001 (0.29)	0.006* (1.99)	-0.002 (-0.49)	0.04 (1.51)	0.05** (3.51)	0.04* (2.67)
GFCF	-0.13* (-2.14)	-0.15* (-2.47)	-0.11 (-1.24)	-0.11 (-1.24)	-0.11* (-2.39)	-0.13* (-2.39)	-0.11 (-1.65)
INFD	0.25* (2.19)	0.17* (2.09)	0.30* (2.05)	0.17* (1.98)	0,10 (1.69)	0.35** (4.26)	0.33** (6.15)
FIND	0.32* (2.43)	0.52* (2.48)	0.58* (2.08)	0.53* (2.78)	0.52* (6.19)	0.15 (1.45)	0.17* (2.45)
INFL	-0.002** (-6.45)	-0.002** (-6.10)	-0.002** (-4.61)	-0.001** (-6.11)	0.001** (-10.46)	0.001** (-4.59)	0.001** (-8.34)
HUM	0.01** (9.14)	0.01** (8.21)	0.01** (8.21)	0.01** (10.11)	0.001** (21.56)	0.01** (9.56)	0.01** (8.36)
FPI.FIND		0.04* (2.34)					
FPI.TR			0.02 (1.32)				
FPI.INFD				0.03 (1.78)			
FPI.HCD					0.003** (5.06)		
FPI.EXD						-0.006** (-2.84)	
FPI.INST							0.001 (1.42)
AR (1) AR (1) Sargan test(P-value) Number of Obs.	3.1 (0.00) 1.3 (0.17) (0.13) 1374	2.5 (0.02) 1.1 (0.28) (0.11) 1374	3.4(0.00) 1.4 (0.18) (0.09) 1374	5.2 (0.00) 0.08 (0.94) (0.15) 1374	2.2 (0.03) 0.67 (0.50) (0.09) 1374	3.4 (0.00) 2.0(0.08) (0.17) 1374	3.5 (0.00) 1.5 (0.14) (0.14) 1374

Numbers in parentheses are t-statistics. ** and * indicates significant at 1% and 5% level respectively.

Low Income Countries (LICs): The results for the sample of LICs are presented in Table 4. Similar to the results for the full sample, FPI has direct positive and significant effect on GDP per capita for LICs. The coefficient of FPI was very small (0.0001), indicating 1 percent increase in FPI (as ratio of GDP) increased per capita income by 0.0001 per cent. Thus, FPI has a small and negligible influence on economic growth for LIC countries. The direct effect of FPI on economic growth in LICs was less than that for the whole sample. Infact we do get negative impact of FPI in few functions though coefficients are insignificant. One of the reasons for this ambiguous or negligible impact of FPI on per capita income may be due to their low absorptive capacities. However, results also reveal that a number of conditional factors such as human capital, financial and infrastructural development have an indirect positive growth impact through FPI, while higher debt burden and trade has a negative impact.

The negative indirect trade effect may be due the fact that increasing FPI inflows causes appreciation of domestic currency, which leads to loss of price competitiveness of exports and thereby fall in exports. The reduction in exports of goods and services may have negative impact on growth (Hobza and Zeugner, 2014). In addition, the interactive terms infrastructure and institutions also yield positive and significant coefficients in our results. This may be because portfolio investments help alleviate infrastructural and institutional bottlenecks which are characteristic of LICs, resulting in positive indirect effects on growth through these channels. Lastly, the combined effect of both direct and indirect effects ($\beta_9 + \beta_{10}$) was found positive indicating that FPI had an overall positive impact on growth of LICs.

Table 4: Long-run coefficients of economic growth (LICs)

Variables	Model-1	Model-2	Model-3	Model-4	Model-5	Model-6	Model-7
Intercept	2.34** (32.89)	2.33** (12.40)	1.93** (16.69)	0.99* (2.81)	2.4** (24.26)	2.34** (33.22)	1.83** (13.22)
LF	-0.01 (-1.11)	0.01 (1.01)	0.07** (4.67)	-0.03 (1.06)	0.18** (9.66)	0.02* (2.11)	0.04** (2.23)
TR	0.08** (5.21)	0.07* (2.64)	0.03* (2.44)	0.07* (2.72)	0.08* (2.83)	0.04** (3.38)	0.20** (2.98)
FPI	0.0001** (2.96)	-0.004* (-2.29)	0.03* (2.49)	-0.002 (-0.99)	-0.007 (-1.51)	0.001 (1.32)	-0.005 (-1.01)
GFCF	0.05** (3.29)	0.06* (2.77)	0.05** (3.23)	0.06** (2.90)	0.07** (2.92)	0.03** (3.39)	0.06* (2.66)
INFD	0.36** (9.35)	0.27** (3.82)	0.53** (11.35)	0.29** (4.04)	0.42** (11.69)	0.44** (15.27)	0.39** (14.26)
FIND	0.25** (5.63)	0.22** (3.48)	0.08* (2.14)	0.26* (3.40)	0.17** (3.69)	0.15** (4.85)	0.19** (6.45)
INFL	-0.001** (-15.14)	-0.001** (-8.37)	-0.002** (-14.56)	-0.001** (-8.73)	-0.001** (-16.68)	-0.001** (-24.59)	-0.001** (-15.59)
HCD	0.003** (9.1)	0.003** (6.38)	0.004** (11.44)	0.003** (7.55)	0.004** (14.32)	0.004** (19.06)	0.003** (16.56)
FPI.FIND		0.04* (2.34)					
FPI.TR			0.005* (-2.02)				
FPI.INFD				0.03* (2.73)			
FPI.HCD					0.001** (5.31)		
FPI.EXD						-.0002* (-2.89)	
FPI.INST							0.006* (2.54)
AR (1)	5.2 (0.00)	1.8 (0.03)	4.5 (0.00)	2.5 (0.02)	2.1 (0.04)	2.7 (0.00)	3.2 (0.00)
AR (2)	0.5 (0.5)	0.6 (0.68)	0.4 (0.66)	0.7 (0.5)	0.4 (0.78)	1.3 (0.08)	1.1 (0.14)
Sargan test (P-vale)	(0.13)	(0.16)	(0.09)	(0.21)	(0.15)	(0.18)	(0.07)
Number of Obs.	466	466	466	466	466	466	466

*Numbers in parentheses are t-statistics. ** and * indicates significant at 1% and 5% level respectively.*

Lower Middle Income Countries (LMICs): The results for the sample of LMICs are presented in Table 5. It is found that FPI has direct positive and significant effect on per capita income. The coefficient of FPI is very small (0.0005) but higher than the coefficient for LICs , indicating a percent increase in FPI (as ratio of GDP) increases per capita income by 0.0005 per cent. Thus, FPI had a positive but marginal influence on economic growth for LMICs. The direct effect of FPI on the economic growth in LMICs was less than that for the whole sample, but higher than that for LICs. Additionally, the results indicate that FPI have indirect positive impact through financial and human capital development. However, higher debt burden and trade have negative impact on per capital income. This could be because LMICs are mostly primary commodity exporters and are not diversified enough to benefit of Global value chain. FPI inflows also do not seem to have a significant effect on growth through infrastructure and institutional development, as evident from the coefficients of their interactive terms. But the combined effect of both direct and indirect effects was found to be positive for all models, indicating that FPI had an overall positive growth impact for LMICs.

Table 5: Long-run coefficients of economic growth (LMICs)

Variables	Model-1	Model-2	Model-3	Model-4	Model-5	Model-6	Model-7
Intercept	1.91** (12.45)	1.75** (12.33)	1.73** (12.69)	1.55** (8.55)	2.4** (24.26)	2.34** (33.22)	2.36** (13.22)
LF	0.10** (10.11)	0.10** (3.95)	0.01 (1.01)	0.12** (6.31)	0.10** (7.06)	0.16* (8.46)	0.05** (5.81)
TR	0.03** (3.45)	0.05** (3.95)	0.08** (5.11)	0.09** (4.95)	0.06** (3.95)	0.11** (11.81)	0.04** (3.62)
FPI	0.0005** (7.76)	0.007 (1.03)	0.034* (5.26)	0.02** (5.99)	0.007* (2.02)	0.008* (3.85)	-0.01 (-1.21)
GFCF	0.03* (2.19)	0.07** (3.51)	0.05* (2.22)	0.06* (2.16)	0.08** (3.56)	0.04* (2.18)	0.04* (2.06)
INFD	0.09** (3.03)	0.14** (4.81)	0.10* (2.82)	0.11* (2.54)	0.14** (4.89)	0.12** (3.41)	0.33** (9.4)2
FIND	0.44** (6.66)	0.18** (10.99)	0.19** (11.91)	0.22* (10.36)	0.18** (10.99)	0.15** (4.85)	0.09 (1.45)
INFL	0.002** (3.34)	0.001** (7.88)	0.001** (6.11)	0.004** (5.64)	0.0003** (4.87)	0.0005** (4.78)	-0.001** (-15.59)
HCD	0.003** (16.23)	0.003** (13.33)	0.002** (13.33)	0.002** (8.37)	0.003** (10.19)	0.004** (7.08)	0.004** (22.34)
FPI.FIND		0.03* (3.33)					
FPI.Trade			-0.007** (-5.34)				
FPI.INFD				0.003 (1.73)			
FPI.HCD					0.003** (3.31)		
FPI.EXD						-.0002** (-3.76)	

FPI.INST							0.002 (1.54)
AR (1)	2.3 (0.02)	2.4 (0.03)	4.5 (0.00)	2.5 (0.02)	2.4 (0.04)	2.2 (0.00)	2.8 (0.00)
AR (2)	0.2 (0.87)	1.7 0.08)	0.4 (0.66)	0.7 (0.5)	1.1 (0.28)	1.7 (0.08)	1.6 (0.12)
Sargan test: P-value	(0.09)	(0.15)	(0.19)	(0.08)	(0.12)	(0.33)	(0.09)
Number of Ob.	785	785	785	786	786	785	786

*Numbers in parentheses are t-statistics. ** and * indicates significant at 1% and 5% level respectively.*

Emerging Countries: The results for emerging countries are given in Table 6 and, results reveals that FPI has direct positive and significant effect on GDP per capita. The direct effect of FPI on economic growth was the highest (coefficient: 0.006) amongst the sets of developing countries which could be attributed to the higher absorptive capacities of emerging countries. The indirect effects of various factors in host country were also analyzed as FPI interacts with these factors to effect economic growth in host countries. The results revealed that the number of host country factors such as financial development and infrastructure development positively influenced the impact of FPI on economic growth for emerging countries (Baharumshah *et al.*, 2017; Sahoo and Dash, 2012; Sahoo, 2012; Sahoo, 2018). On the other hand, trade openness and external debt depressed the effect of FPI on growth.

Table 6: **Long-run coefficients of economic growth (Emerging countries)**

Variables	Model-1	Model-2	Model-3	Model-4	Model-5	Model-6	Model-7
Intercept	3.01** (17.45)	3.57** (11.58)	4.14** (9.88)	2.66** (6.32)	2.54** (7.26)	3.90** (10.65)	3.80** (12.33)
LF	-0.05** (-6.11)	-0.10** (-2.95)	-0.12** (-4.95)	-0.04 (-1.07)	-0.04* (-2.06)	-0.06 (-1.5)	-0.05* (2.-1)
TR	0.03* (2.45)	0.09** (3.77)	0.06* (1.99)	0.08** (5.11)	0.09** (3.65)	0.06* (2.81)	0.07** (3.04)
FPI	0.006** (5.16)	0.002 (0.79)	0.16* (4.79)	-0.001* (-2.26)	0.07** (4.24)	0.03** (4.35)	0.07* (2.01)
GFCF	0.03* (2.03)	-0.07 (1.58)	0.07 (1.20)	-0.10 (1.57)	0.02 (1.56)	-0.06 (-0.88)	-0.07 (-1.06)
INFD	0.33** (9.55)	0.35** (11.02)	0.34** (8.42)	0.32* (8.02)	0.28** (7.57)	0.52** (13.15)	0.35** (10.9)
FIND	0.17** (4.31)	0.22** (6.87)	0.32** (6.91)	0.19** (11.91)	0.21** (14.67)	0.15** (3.05)	0.29** (5.45)
INFL	-0.002** (-3.34)	-0.002** (-16.50)	-0.003** (-11.20)	-0.004** (13.67)	-0.003** (-8.55)	-0.003** (-11.78)	-0.003** (-15.59)
HCD	0.01** (12.46)	0.01** (12.63)	0.01** (6.23)	0.02** (11.38)	0.03** (12.19)	0.004** (7.08)	0.004** (22.34)
FPI.FIND		0.02* (2.13)					
FPI.Trade			-0.03* (-4.33)				
FPI.INFD				0.04* (5.04)			
FPI.HCD					-0.003**		

					(-3.31)		
FPI.EXD						-.0002** (-3.79)	
FPI.INST							-0.008 (-1.44)
AR (1)	1.9 (0.02)	3.6 (0.03)	3.4 (0.00)	2.9 (0.02)	2.4 (0.04)	2.2 (0.04)	1.7 (0.05)
AR (1)	0.9 (0.37)	0.6 (0.54)	0.6 (0.55)	0.54 (0.5)	1.6 (0.08)	1.2 (0.28)	0.6 (0.67)
Sargan test: P-vale	(0.07)	(0.17)	(0.19)	(0.18)	(0.11)	(0.09)	(0.10)
Number of Ob.	322	322	322	322	322	322	322

*Numbers in parentheses are t-statistics. ** and * indicates significant at 1% and 5% level respectively.*

Thus, it can be concluded that FPI inflows has a positive overall impact on the economic growth of the sample of developing countries. It also seemed to indirectly affect the growth of these countries through its effect on their financial sector, human capital levels and state of external debt. Portfolio investments were also found to have a positive impact on the growth of all three categories of developing countries i.e. LICs, LMICs and emerging economies. The magnitude of these effects varied across these different categories owing to their different absorptive capacities. FPI inflows were the most effective for emerging economies as these countries had the most conducive environment for capturing positive spillovers from foreign portfolio investment inflows. The effect of FPI on the economic growth of LMICs and LICs were also positive but marginal. In addition, FPI indirectly affected growth through its effect on various domestic factors, the effective transmission channel varying with the country category being studied. Financial sector development emerged as an important factor through which FPI positively impacted growth across all three categories.

(iii) Panel Causality between FPI and Per Capita Income

The results of Dumitrescu and Hurlin (2012) panel causality between FPI and per capita income are presented in Table 7. The causality results provide the evidence of bi-directional or mutual feedback relationship between the two for the whole sample and three sub samples. These results are in contrast to previous studies by Guluzar and Bener (2013) and Ahmed *et al.*, (2015).

Table 7: Panel causality test (between) RYPC and FPI (2000-2017)

Direction of causality	Test statistics	Value (Whole sample)	Value (LIC)	Value (LMIC)	Value (Emerging countries)
FPI →RYPC	Z-bar	7.86**	5.15**	4.59	4.67**
	Z-bar tilde	4.85**	2.42**	1.80#	3.07**
RYPC→FPI	Z-bar	4.67**	3.03*	5.10**	9.42**
	Z-bar tilde	2.51*	1.14	0.81	3.02**

*Notes: ** and * denotes rejection of null of no causality at 1 and 5 % level. Optimal lag order is selected the basis of AIC Criteria.*

6. Summary and Concluding Remarks

Since the 1997-98 Asian financial crisis and more recently, the global financial crisis of 2008-09, there has been considerable controversy regarding the role of FPI inflows in developing countries. It is true that FPI can promote economic growth by increasing investment, augmenting savings, developing the financial sector and improving overall macroeconomic outcomes for a country. But these positive benefits of portfolio investments come with certain caveats. For one, these beneficial effects are subject to the absorptive capacities of the host countries. Even more alarmingly, these FPI inflows are susceptible to flow reversals at short notice leading to unfavorable macroeconomic outcomes. In this context, the current study strived to understand more comprehensively the role of FPI in promoting economic growth for a sample 82 developing countries for the period 2000-2017. For the purpose, it examined how and to what extent FPI affected economic growth across various types of developing countries, taking into consideration the different absorptive capacities of these countries. In addition, it sought to understand the transmission channels through which FPI promoted growth in developing countries by incorporating various conditional factors – institutions, human capital, trade, infrastructure, financial development and foreign debt. As such, the paper applied a dynamic panel data analysis for 82 developing countries.

The findings reveal that FPI had a positive direct impact on growth for the sample of all developing countries as well as the different country categories i.e. LICs, LMICs and emerging countries. However, the size of the growth impact was not uniform across different country groups and varied according to their level of development. Emerging countries benefited more than LMICs and LICs, the beneficial effects for the latter being positive but marginal. This was partly due to higher absorptive capacity of emerging countries compared to other groups. Host country factors such as human capital and financial development positively influenced the effect of FPI on growth, while external debt depressed the effect of FPI on growth. Other factors could positively or negatively affect the impact of FPI on growth depending on the nature of the country category. Further, the study also examined panel causality between FPI and economic growth and found evidence of a bi-directional or feedback relationship between FPI and growth. This implies that FPI inflows promote economic growth and, economic growth in turn results in a surge in FPI.

In conclusion, the study shows that FPI has a direct and positive effect on growth, as well as an indirect effect through its various local factors. The magnitude of these impacts varies with the development level of the recipient country and its underlying domestic conditions. The results of the study have several policy implications. *Firstly*, given that FPI promotes economic growth in host countries, there is a need to push for pro-FPI policies and removing/re-adjusting restrictive policies on capital inflows. However, countries must exercise caution while making these adjustments, keeping in mind the possible detrimental effects of short term FPI inflows. This is especially true for LICs and LMICs where the potential benefits from FPI may be marginal and hence, possible costs must be measured closely against benefits before taking any decisions. *Secondly*, efforts should be made to improve and upgrade the absorptive capacities of developing countries (especially for LICs and LMICs) in order to reap the benefits of FPI and sustain economic growth. This includes working towards improvement of human capital levels, development of financial sectors and reducing external debt. *Lastly*, to optimize the effect of portfolio investment, there is a need to harmonise policies on FPI with national macroeconomic policies on trade, foreign exchange, monetary policies, income and employment.

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Appendix Table A1: Macroeconomic Overview of Country Groups

	Total Sample	LIC	LIMC	Emerging countries
Variables	2000-2017	2000-2017	2000-2017	2000-2017
GDP growth rate(%)	4.6	4.3	4.9	4.3
Per Capita Income	2895	560	1920	9389
Investment rate (% GDP)	23.4	22	24	25
FDI (% GDP)	4.37	5.27	4.1	3.8
FPI (% GDP)	2.44	4.3	1.2	1.0
Trade(% GDP)	76.5	63	83	78
Merchandise Exports (%)	24	15	26	34
Debt (% GDP)	59	70	58	40
M2 (% GDP)	47	33	47	73
Bank credit (% GDP)	32	16	32	60
Gross Enrollment Ratio	59	32	63	88

Source: Author's Compilation from World Development Indicator, World Bank

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